

SEQUENCE LISTING

110 Kuramitsu Seiki.
Yokoyama Shigeyuki

120 GENE ENCODING DNA REPAIR ENZYME

130 PH-1261-US

140

141

150 JP2001-47762

151 2001-02-23

160 17

170 PatentIn Ver. 2.0

210 1

211 975

212 DNA

213 Thermus thermophilus

220

221 CDS

222 (1)... (975)

400 1

gtg	gag	gcc	tgg	cgg	aaa	gcc	ctc	ctc	gcc	tgg	tac	cgg	gaa	aac	gcc	48
Val	Glu	Ala	Trp	Arg	Lys	Ala	Leu	Leu	Ala	Trp	Tyr	Arg	Glu	Asn	Ala	
1				5					10				15			

cgc	ccc	ctc	ccc	tgg	cgg	ggg	gag	aag	gac	cct	tac	cgc	gtc	ctg	gtc	96
Arg	Pro	Leu	Pro	Trp	Arg	Gly	Glu	Lys	Asp	Pro	Tyr	Arg	Val	Leu	Val	
		20				25						30				

tcc	gag	gtc	ctt	ctg	cag	cag	acc	cgg	gtg	gag	cag	gcc	ctc	ccc	tat	144
Ser	Glu	Val	Leu	Leu	Gln	Gln	Thr	Arg	Val	Glu	Gln	Ala	Leu	Pro	Tyr	
		35				40						45				

tac	cgc	cgc	ttt	ctg	gag	cgc	ttt	ccc	acc	ctg	aag	gcc	ctg	gcc	ggc	192
Tyr	Arg	Arg	Phe	Leu	Glu	Arg	Phe	Pro	Thr	Leu	Lys	Ala	Leu	Ala	Ala	
		50				55						60				

gct	tcc	ctg	gaa	gag	gtc	ctt	agg	gtc	tgg	cag	ggg	ggc	ggc	tac	tac	240
Ala	Ser	Leu	Glu	Glu	Val	Leu	Arg	Val	Trp	Gln	Gly	Ala	Gly	Tyr	Tyr	
65					70					75				80		

cgg	cgg	ggc	gaa	cac	ctc	cac	cgc	ctg	gcc	cga	age	gtg	gag	gag	ctt	288
Arg	Arg	Ala	Glu	His	Leu	His	Arg	Leu	Ala	Arg	Ser	Val	Glu	Glu	Leu	

85

90

95

ccc ccg age ttc gcc gag ctt cgg ggg ctt cct ggt ctc ggg cct tac 336
 Pro Pro Ser Phe Ala Glu Leu Arg Gly Leu Pro Gly Leu Gly Pro Tyr
 100 105 110

acc gcg gcg gcg gtg gcc tcc atc gcc ttc ggg gag cgg gtg gcg gcg 384
 Thr Ala Ala Ala Val Ala Ser Ile Ala Phe Gly Glu Arg Val Ala Ala
 115 120 125

gtg gac ggg aac gtc cgg agg gtc ctc tcc cgc ctc ttc gcc cgg gaa 432
 Val Asp Gly Asn Val Arg Arg Val Leu Ser Arg Leu Phe Ala Arg Glu
 130 135 140

age ccc aag gag aag gag ctt ttc gcc ctc gcc cag ggc ctc ctc ccc 480
 Ser Pro Lys Glu Lys Glu Leu Phe Ala Leu Ala Gln Gly Leu Leu Pro
 145 150 155 160

gag ggc gtg gac ccg ggg gtg tgg aac cag gcc ctc atg gag ctc ggg 528
 Glu Gly Val Asp Pro Gly Val Trp Asn Gln Ala Leu Met Glu Leu Gly
 165 170 175

gcc acg gtc tgc ctg ccg aaa cgg ccc cgt tgc ggg gcc tgc ccc cta 576
 Ala Thr Val Cys Leu Pro Lys Arg Pro Arg Cys Gly Ala Cys Pro Leu
 180 185 190

ggg gcc ttc tgc cgg ggg aag gag gcc ccc ggg cgc tac ccc gcg ccc 624
 Gly Ala Phe Cys Arg Gly Lys Glu Ala Pro Gly Arg Tyr Pro Ala Pro
 195 200 205

agg aag cgc cgg gcg aag gag gag cgc ctc gtc gcc ctc gtc ctc ctc 672
 Arg Lys Arg Arg Ala Lys Glu Glu Arg Leu Val Ala Leu Val Leu Leu
 210 215 220

ggg cgg aag ggg gtg cac ctg gaa agg ctt gag ggg cgc ttc cag ggc 720
 Gly Arg Lys Gly Val His Leu Glu Arg Leu Glu Gly Arg Phe Gln Gly
 225 230 235 240

ctc tac ggc gtc ccc ctc ttt ccc cct gag gag ctt ccc ggg cgg gag 768
 Leu Tyr Gly Val Pro Leu Phe Pro Pro Glu Glu Leu Pro Gly Arg Glu
 245 250 255

gcg gcc ttc ggg gtg agg tet agg ccc cta gcc gag gtg cgc cac gcc 816
 Ala Ala Phe Gly Val Arg Ser Arg Pro Leu Gly Glu Val Arg His Ala
 260 265 270

ctc acc cac cgg agg ctt cgc gtg gag gtg cgg ggg gcc ctt tgg gaa 864
 Leu Thr His Arg Arg Leu Arg Val Glu Val Arg Gly Ala Leu Trp Glu
 275 280 285

ggg gag ggg gag gac ccc tgg aag agg ccc cta ccc aag ctc atg gag 912

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu
 290 295 300

aag glg ctc cgc aag ggc ctt ccc ctc ctc gct cat ggc ggc gta gtc 960
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 <213> Thermus thermophilus

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Ser Glu Val Leu Leu Gln Gln Thr Arg Val Glu Gln Ala Leu Pro Tyr
 35 40 45

Tyr Arg Arg Phe Leu Glu Arg Phe Pro Thr Leu Lys Ala Leu Ala Ala
 50 55 60

Ala Ser Leu Glu Glu Val Leu Arg Val Trp Gln Gly Ala Gly Tyr Tyr
 65 70 75 80

Arg Arg Ala Glu His Leu His Arg Leu Ala Arg Ser Val Glu Glu Leu
 85 90 95

Pro Pro Ser Phe Ala Glu Leu Arg Gly Leu Pro Gly Leu Gly Pro Tyr
 100 105 110

Thr Ala Ala Ala Val Ala Ser Ile Ala Phe Gly Glu Arg Val Ala Ala
 115 120 125

Val Asp Gly Asn Val Arg Arg Val Leu Ser Arg Leu Phe Ala Arg Glu
 130 135 140

Ser Pro Lys Glu Lys Glu Leu Phe Ala Leu Ala Gln Gly Leu Leu Pro
 145 150 155 160

Glu Gly Val Asp Pro Gly Val Trp Asn Gln Ala Leu Met Glu Leu Gly
 165 170 175

Ala Thr Val Cys Leu Pro Lys Arg Pro Arg Cys Gly Ala Cys Pro Leu
180 185 190

Gly Ala Phe Cys Arg Gly Lys Glu Ala Pro Gly Arg Tyr Pro Ala Pro
195 200 205

Arg Lys Arg Arg Ala Lys Glu Glu Arg Leu Val Ala Leu Val Leu Leu
210 215 220

Gly Arg Lys Gly Val His Leu Glu Arg Leu Glu Gly Arg Phe Gln Gly
225 230 235 240

Leu Tyr Gly Val Pro Leu Phe Pro Pro Glu Glu Leu Pro Gly Arg Glu
245 250 255

Ala Ala Phe Gly Val Arg Ser Arg Pro Leu Gly Glu Val Arg His Ala
260 265 270

Leu Thr His Arg Arg Leu Arg Val Glu Val Arg Gly Ala Leu Trp Glu
275 280 285

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu
290 295 300

Lys Val Leu Arg Lys Ala Leu Pro Leu Leu Ala His Ala Gly Val Val
305 310 315 320

Pro Leu Pro Asp Ala
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<210> 3

<211> 1998

<212> DNA

<213> Thermus thermophilus

<220>

<221> CDS

<222> (1) .. (1998)

<400> 3

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Met Arg Asp Arg Val Arg Trp Arg Val Leu Ser Leu Pro Pro Leu Ala
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cag tgg cgg gag gtg atg gcg gcc ttg gag gtg ggg ccg gag gcc gcc 96
Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala
20 25 30

ctg gcc tac tgg cac cgg gcc ttt agg cgc aag gag gac ctg gac ccc 144
Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro

35

40

45

ccc etc gcc etc ctt ccc etc aag ggc ctg agg gag gcg gcg gcc etc 192
 Pro Leu Ala Leu Leu Pro Leu Lys Gly Leu Arg Glu Ala Ala Ala Leu
 50 55 60

ctg gag gag gcg etc cgc cag ggg aag cgg atc cgc gtc cac ggg gac 240
 Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp
 65 70 75 80

tac gac gcc gac ggg etc acg gcc acg gcc atc ctg gtt cgg gcc etc 288
 Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu
 85 90 95

gcc gcc ttg gcc gcc gac gtc cac ccc ttc atc ccc cac cgg ctg gag 336
 Ala Ala Leu Gly Ala Asp Val His Pro Phe Ile Pro His Arg Leu Glu
 100 105 110

gaa ggg tac ggg gtg ctg atg gag cgg gtt ccc gag cac etc gag gcc 384
 Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala
 115 120 125

tcg gac etc ttc etc acc gtg gac tgc ggg atc acg aac cac gcc gag 432
 Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu
 130 135 140

etc agg gag ctt ttg gaa aac ggg gtg gag gtg atc gtc acc gac cac 480
 Leu Arg Glu Leu Leu Glu Asn Gly Val Glu Val Ile Val Thr Asp His
 145 150 155 160

cac acc ccc gcc aag acc cct tcc ccc gcc etc gtg gtc cac ccc gcc 528
 His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala
 165 170 175

etc acc cgg gac ctt aag gag aag ccc acg ggg gcg ggg gtg gtc ttc 576
 Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe
 180 185 190

etc etc etc tgg gcc etc cac gag cgc ctg gcc ctt ccc cca ccc ctg 624
 Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu
 195 200 205

gag tac gcc gac etc gcc gcg gtg gcc acc atc gcc gac gtg gcc ccc 672
 Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro
 210 215 220

ctt tgg gcc tgg aac cgg gcc ttg gtg aag gag gcc ctg gcc cgc atc 720
 Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile
 225 230 235 240

ccc gcc tcc tcc tgg gtt ggg etc agg ctt ctg gcc gag gcg gtg ggg 768

Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly	
245 250 255	
tac acg ggg aag gcg gtg gag gtg gcc ttc cgc atc gcc ccc egg atc	816
Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile	
260 265 270	
aac gcg gca agc cgc ctc ggg gag gct gag aag gcc cta agg ctc ctc	864
Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu	
275 280 285	
ctc acc gac gac gcg gcc gag gcc cag gcc ctc gtg ggg gaa ctc cac	912
Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His	
290 295 300	
cgg ctg aac gcc cgc cgc cag acc ctg gag gag gcc atg ctc agg aag	960
Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys	
305 310 315 320	
ctc ctc ccc cag gcg gac ccc gag gcc aag gcc atc gtc ctc ctg gac	1008
Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp	
325 330 335	
ccc gag ggg cac ccg ggg gtg atg ggc atc gtg gcg agc cgc atc ctg	1056
Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu	
340 345 350	
gag gcc acc ctc cgg ccc gtc ttc ctg gtg gcc cag ggc aag ggg acg	1104
Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr	
355 360 365	
gtg cgg agc ctc gcc ccc atc agc gcc gtg gag gcc cta agg agc gcc	1152
Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala	
370 375 380	
gag gac ctt ttg ttg cgc tac ggg ggg cac aag gag gcg gcg gcc ttc	1200
Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe	
385 390 395 400	
gcc atg gac gag gcc ctc ttc ccc gcc ttc aag gcc cgg gtg gag gcc	1248
Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala	
405 410 415	
tac gcc gcc cgc ttc ccc gac ccc gtg cgc gag gtg gcc ctt ttg gac	1296
Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp	
420 425 430	
ctg ctt ccg gag ccc gcc ctc ctc ccc cag gtc ttc cgg gag ctc gcc	1344
Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala	
435 440 445	

ctt ttg gag ccc tac ggc gag gga aac ccc gag ccc etc ttc etc etc	1392
Leu Leu Glu Pro Tyr Gly Glu Gly Asn Pro Glu Pro Leu Phe Leu Leu	
450 455 460	
ttc ggc gcc ccg gag gag gcc cgg cgc etc ggg gag gcc cgc cac etc	1440
Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu	
465 470 475 480	
gcc ttc cgc ctg aag ggg gtg cgg gtc ctg gcc tgg aaa cag ggg gac	1488
Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp	
485 490 495	
etc gcc ctg ccc ccg gag gtg gag gtg gcg gcc etc etc agc gaa aac	1536
Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn	
500 505 510	
gcc tgg aac gcc cac etc gcc tac gag gtc cag gcg gtg gac ctg cga	1584
Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg	
515 520 525	
aag cca gag gcg ctg gag gcc ggg atc gcg ccc ttc gcc tac ccc ctg	1632
Lys Pro Glu Ala Leu Glu Gly Gly Ile Ala Pro Phe Ala Tyr Pro Leu	
530 535 540	
ccc etc etc gag gcc ctg gcc cgg gcc cgc ctg ggg gaa ggg gtc tac	1680
Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr	
545 550 555 560	
gtc ccc gag gac aac cct gag ggg ctg gac tac gcc agg aag gcg gcc	1728
Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly	
565 570 575	
ttc cgc etc etc ccc ccc gag gag gcc ggg ctt tgg etc gcc etc ccc	1776
Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro	
580 585 590	
cca agg ccg gtc ctg gcc agg cgg gtg gag gtg gcc ctg ggg cgg gag	1824
Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu	
595 600 605	
gcg cgg gcc agg ctt tcc gcc ccc ccc gtc etc cac acc ccc gag gcc	1872
Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala	
610 615 620	
cgg etc aaa gcc etc gtc cac cgc cgc etc etc ttc gcc tac gag cgc	1920
Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg	
625 630 635 640	
cgt cac ccg gcc etc ttc agc gag gcc etc etc gcc tac tgg gag gtg	1968
Arg His Pro Gly Leu Phe Ser Glu Ala Leu Leu Ala Tyr Trp Glu Val	
645 650 655	

aac cgt gta cag gag ccc ggc gga agc cca
 Asn Arg Val Gln Glu Pro Ala Gly Ser Pro
 660 665

1998

210 4
 211 666
 212 PRT
 213 Thermus thermophilus

400 4
 Met Arg Asp Arg Val Arg Trp Arg Val Leu Ser Leu Pro Pro Leu Ala
 1 5 10 15

Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala
 20 25 30

Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro
 35 40 45

Pro Leu Ala Leu Leu Pro Leu Lys Gly Leu Arg Glu Ala Ala Ala Leu
 50 55 60

Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp
 65 70 75 80

Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu
 85 90 95

Ala Ala Leu Gly Ala Asp Val His Pro Phe Ile Pro His Arg Leu Glu
 100 105 110

Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala
 115 120 125

Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu
 130 135 140

Leu Arg Glu Leu Leu Glu Asn Gly Val Glu Val Ile Val Thr Asp His
 145 150 155 160

His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala
 165 170 175

Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe
 180 185 190

Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu
 195 200 205

Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro
210 215 220

Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile
225 230 235 240

Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly
245 250 255

Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile
260 265 270

Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu
275 280 285

Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His
290 295 300

Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys
305 310 315 320

Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp
325 330 335

Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu
340 345 350

Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr
355 360 365

Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala
370 375 380

Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe
385 390 395 400

Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala
405 410 415

Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp
420 425 430

Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala
435 440 445

Leu Leu Glu Pro Tyr Gly Glu Gly Asn Pro Glu Pro Leu Phe Leu Leu
450 455 460

Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu
465 470 475 480

Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp
 485 490 495

Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn
 500 505 510

Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg
 515 520 525

Lys Pro Glu Ala Leu Glu Gly Gly Ile Ala Pro Phe Ala Tyr Pro Leu
 530 535 540

Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr
 545 550 555 560

Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly
 565 570 575

Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro
 580 585 590

Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu
 595 600 605

Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala
 610 615 620

Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg
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Arg His Pro Gly Leu Phe Ser Glu Ala Leu Leu Ala Tyr Trp Glu Val
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Asn Arg Val Gln Glu Pro Ala Gly Ser Pro
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<212> DNA

<213> Thermus thermophilus

<220>

<221> CDS

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Met Arg Leu Leu Leu Phe Arg Gln Arg Asn Phe Arg Asn Leu Ala Leu

1

5

10

15

gag gcc tac cgc ccc ccg ccg ggc ctt tcc gcc ctg gtg ggg gcc aac	96
Glu Ala Tyr Arg Pro Pro Pro Gly Leu Ser Ala Leu Val Gly Ala Asn	
20 25 30	
gcc cag ggg aag acg agc ctc ctc ctg ggg atc cac ctg gcc cta ggg	144
Ala Gln Gly Lys Thr Ser Leu Leu Leu Gly Ile His Leu Ala Leu Gly	
35 40 45	
ggg gag gtc ccc ctg ggc ctt gcc gac ctc gtc cgc ttc ggg gag gag	192
Gly Glu Val Pro Leu Gly Leu Ala Asp Leu Val Arg Phe Gly Glu Glu	
50 55 60	
gag gcc tgg ctc cac gcc gag gtg gag acg gag ctc ggg gcc tac cgc	240
Glu Ala Trp Leu His Ala Glu Val Glu Thr Glu Leu Gly Ala Tyr Arg	
65 70 75 80	
ctg gag cac cgc ctg ggc ccc ggg ggg cgg gag gtc ctc ctc aac ggg	288
Leu Glu His Arg Leu Gly Pro Gly Gly Arg Glu Val Leu Leu Asn Gly	
85 90 95	
aag cgg gtg agc ctt cgg acc ctt tgg gag ctt ccc ggc tgg gtc ctc	336
Lys Arg Val Ser Leu Arg Thr Leu Trp Glu Leu Pro Gly Ser Val Leu	
100 105 110	
gtc tcc cct ctg gac ctc gag gcg gtc ctc ggg ccc aag gag gag cgg	384
Val Ser Pro Leu Asp Leu Glu Ala Val Leu Gly Pro Lys Glu Glu Arg	
115 120 125	
cgg gcc tac ctg gac cgg ctc atc gcc cgc ttc tcc cgc cgc tac gcc	432
Arg Ala Tyr Leu Asp Arg Leu Ile Ala Arg Phe Ser Arg Arg Tyr Ala	
130 135 140	
gcc ctc ctt tcc gcc tac gag aag gcg ctg cgc cag cgg aac gcc ctc	480
Ala Leu Leu Ser Ala Tyr Glu Lys Ala Leu Arg Gln Arg Asn Ala Leu	
145 150 155 160	
ctc aag gcc ggg ggg gag ggc ctt tcc gcc tgg gac cgg gag ctc gcc	528
Leu Lys Ala Gly Gly Glu Gly Leu Ser Ala Trp Asp Arg Glu Leu Ala	
165 170 175	
cgc tac ggg gac gag atc gtg gcc ctg agg cgc cgc ttc ctc cgg cgc	576
Arg Tyr Gly Asp Glu Ile Val Ala Leu Arg Arg Arg Phe Leu Arg Arg	
180 185 190	
ttc gcc ccc atc ctg cgg gag gtc cac gcc gcc ctc gcc gcc aag gag	624
Phe Ala Pro Ile Leu Arg Glu Val His Ala Ala Leu Ala Ala Lys Glu	
195 200 205	
gcg ggg ctt cgc ttg gag gag acc gcg ggg gaa ggg gtg ctc cgg gcc	672
Ala Gly Leu Arg Leu Glu Glu Thr Ala Gly Glu Gly Val Leu Arg Ala	
210 215 220	

etc gag gcc agc cgg gcc gag gag cgg gaa cgg gcc cag acc ctg gtg 720
 Leu Glu Ala Ser Arg Ala Glu Glu Arg Glu Arg Gly Gln Thr Leu Val
 225 230 235 240

ggg ccc cac cgg gac gac ctg gtc ttc ctc ctg gag ggg cgg ccc gcc 768
 Gly Pro His Arg Asp Asp Leu Val Phe Leu Leu Glu Gly Arg Pro Ala
 245 250 255

cac cgg ttc gcc agc cgc ggg gag gcc aag acc ctg gcc ctg gcc ctg 816
 His Arg Phe Ala Ser Arg Gly Glu Ala Lys Thr Leu Ala Leu Ala Leu
 260 265 270

cgc ctc gcc gag cac cgc ctc ctc ggc gag cac cac gcc gag ccc ccc 864
 Arg Leu Ala Glu His Arg Leu Leu Gly Glu His His Gly Glu Pro Pro
 275 280 285

ctc ctc ctc gtg gac gag tgg ggg gag gag ctg gac gag gcc cgc agg 912
 Leu Leu Leu Val Asp Glu Trp Gly Glu Glu Leu Asp Glu Ala Arg Arg
 290 295 300

egg gcc gtc ctc gcc tac gcc cag gcc ctg ccc cag gcc atc ctg gcc 960
 Arg Ala Val Leu Ala Tyr Ala Gln Ala Leu Pro Gln Ala Ile Leu Ala
 305 310 315 320

ggg ctg gaa gcc ccc ccg ggg gtg ccg gta tgc tgc gtg gta cga ggg 1008
 Gly Leu Glu Ala Pro Pro Gly Val Pro Val Cys Ser Val Val Arg Gly
 325 330 335

gtg gtc ctg tgc cct gcc gcc 1029
 Val Val Leu Cys Pro Gly Ala
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<210> 6

<211> 343

<212> PRT

<213> Thermus thermophilus

<400> 6

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 20 25 30

Ala Gln Gly Lys Thr Ser Leu Leu Leu Gly Ile His Leu Ala Leu Gly
 35 40 45

Gly Glu Val Pro Leu Gly Leu Ala Asp Leu Val Arg Phe Gly Glu Glu
 50 55 60

Glu Ala Trp Leu His Ala Glu Val Glu Thr Glu Leu Gly Ala Tyr Arg
65 70 75 80

Leu Glu His Arg Leu Gly Pro Gly Gly Arg Glu Val Leu Leu Asn Gly
85 90 95

Lys Arg Val Ser Leu Arg Thr Leu Trp Glu Leu Pro Gly Ser Val Leu
100 105 110

Val Ser Pro Leu Asp Leu Glu Ala Val Leu Gly Pro Lys Glu Glu Arg
115 120 125

Arg Ala Tyr Leu Asp Arg Leu Ile Ala Arg Phe Ser Arg Arg Tyr Ala
130 135 140

Ala Leu Leu Ser Ala Tyr Glu Lys Ala Leu Arg Gln Arg Asn Ala Leu
145 150 155 160

Leu Lys Ala Gly Gly Glu Gly Leu Ser Ala Trp Asp Arg Glu Leu Ala
165 170 175

Arg Tyr Gly Asp Glu Ile Val Ala Leu Arg Arg Arg Phe Leu Arg Arg
180 185 190

Phe Ala Pro Ile Leu Arg Glu Val His Ala Ala Leu Ala Ala Lys Glu
195 200 205

Ala Gly Leu Arg Leu Glu Glu Thr Ala Gly Glu Gly Val Leu Arg Ala
210 215 220

Leu Glu Ala Ser Arg Ala Glu Glu Arg Glu Arg Gly Gln Thr Leu Val
225 230 235 240

Gly Pro His Arg Asp Asp Leu Val Phe Leu Leu Glu Gly Arg Pro Ala
245 250 255

His Arg Phe Ala Ser Arg Gly Glu Ala Lys Thr Leu Ala Leu Ala Leu
260 265 270

Arg Leu Ala Glu His Arg Leu Leu Gly Glu His His Gly Glu Pro Pro
275 280 285

Leu Leu Leu Val Asp Glu Trp Gly Glu Glu Leu Asp Glu Ala Arg Arg
290 295 300

Arg Ala Val Leu Ala Tyr Ala Gln Ala Leu Pro Gln Ala Ile Leu Ala
305 310 315 320

Gly Leu Glu Ala Pro Pro Gly Val Pro Val Cys Ser Val Val Arg Gly
325 330 335

Val Val Leu Cys Pro Gly Ala
340

· 210 · 7
· 211 · 2934
· 212 · DNA
· 213 · *Thermus thermophilus*

· 220 ·
· 221 · CDS
· 222 · (1) .. (2934)

· 400 · 7

atg gaa atc gcg cta gag agg atc tac ggc cac cgc ctg gcg ctc ccg	48
Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro	
1 5 10 15	

cag gtg ggg gcg gcc ttg ctt ttc gcc cag gag gcc ccc ccg gcc ctc	96
Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu	
20 25 30	

ctc ctc gtc ccc gag gcg cgg ctt agg cgc tac cgg gac ctc tcc gcc	144
Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala	
35 40 45	

ttc ggg gcc aag gtc tac gtg aac ccc ggc ctc gag gcc ctg gag gaa	192
Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu	
50 55 60	

aaa gcc ctc ttc gtc ctc tcc tac gag gag gcc cta agc ccc ttc ccc	240
Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro	
65 70 75 80	

gag gac cct gag gcc tgg cgg ctt ctt ctg gag gtg gcc cgc gcc tac	288
Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr	
85 90 95	

ccc cgg gag gcc ctc ctc tcc cgc ctc ctc aag ctg gcc tac gcc cgg	336
Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg	
100 105 110	

gac gag gac tac cgc gtc ctg ggg gag gtg gtg gag ctc gcc gag gtg	384
Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val	
115 120 125	

cgc ctg gag ttc ttc ggg gac gag ctg gaa agg ctt gtg gtc cgg ggg	432
Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly	
130 135 140	

gag gaa agg cgg cgc cac gtc ctt ctg ccc aag ccg ggg aag gcg gag	480
Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu	
145 150 155 160	
ggc ttc acc tcc aag aag gtc ctc cac ttc cct ggc ccc gtc tac ctg	528
Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu	
165 170 175	
gac acc ccc gcc ctc gcc ccc aag gcc ctt tgg ccc ctc ctc gcg gga	576
Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly	
180 185 190	
agg ccc tgg gtg gcc ctg ggc gcc ggg gtg gag ctc ccc ccc ttg gag	624
Arg Pro Trp Val Ala Leu Gly Gly Gly Val Glu Leu Pro Pro Leu Glu	
195 200 205	
ctc ggg gcg agg ccc ctt cct cct tac cgg gga agc ctg aag gcc ctg	672
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu	
210 215 220	
gaa aag gac ctc gcc cgc tgg ctt gcc gag ggg aag cgg gtc cac ctc	720
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu	
225 230 235 240	
ttc gtg ggc cac gcc cgc acc ttg gag tac ctc aaa agg cgc ctc cag	768
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln	
245 250 255	
gcc ttc tgc ccc ctc atc ctg gac cgc ttc ccc gcc ccc aag ggg cgg	816
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg	
260 265 270	
ctt gcc ctc ctc ccc ggg gac ttt gag ggc ggg gcg gag tgg gga gag	864
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu	
275 280 285	
tgg gtc ctc ctc acc gag gcc ctg gtc ttc gcc acc ggg ggg gtg cgg	912
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg	
290 295 300	
gcc agg gtc cgg gta ggg gag ggg ctc agc gac ccc ggg gcc ctt tcc	960
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser	
305 310 315 320	
cca ggg gac tac ctc atc cac cgg gag cac gcc gtc ggg cag tac ctg	1008
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu	
325 330 335	
ggc ctc gag acc cgg gag gtc ctg ggg gtc aag cgg gac tac ctg gtc	1056
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val	
340 345 350	

ctg cgc tac aag ggg gaa ggg aag etc tac etc ccc gtg gag cag ctt	1104
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu	
355 360 365	
ccc etc etc aag cgc cac ccc ggg acc acc gac gac ccc ccg gag ctt	1152
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu	
370 375 380	
tcc tcc ctg ggc aag aac gag tgg caa agg gcc aag gag cgg gcg cgg	1200
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg	
385 390 395 400	
aag gac gtg gag gag ctg gct ggg cgc etc etc gtc etc cag gcc aag	1248
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys	
405 410 415	
cgc aag gcc acc ccg ggc cgg gcc ttt ccc cct ttg ccc gag tgg gat	1296
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp	
420 425 430	
cct ctg gtg gag aag ggg ttc ccc tac gag etc acc ccc gac cag aag	1344
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys	
435 440 445	
cgg gcc ctg gag gag gtc etc cgc gac ctg gaa agc ccc cac ccc atg	1392
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met	
450 455 460	
gac cgc ctg gtc tgc ggg gac gtg ggc ttc ggc aag acg gag gtg gcc	1440
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala	
465 470 475 480	
ctg agg gcc gcc cac cgg gtg gtg ggg cac ggg gcc cag gtg gcc ttc	1488
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe	
485 490 495	
ctg ggg cca acc acc etc etc gcc gag cag cac ggg aag acc ttt agg	1536
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg	
500 505 510	
gag cgc ttc cag ggg ctt ccc gtg agg gtt gcg gtc etc tcc cgc ttc	1584
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe	
515 520 525	
acc ccg ccc aag gag gag gag gcc atc cta aaa gcc etc gcc gag ggg	1632
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly	
530 535 540	
acg gtg gac atc gtc atc ggc acc cac cgc etc etc cag gag gac gtg	1680
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	

545	550	555	560	
cgc ttc agg gac ctc ggc ctc ctc atc gtg gac gag gag cac cgc ttc				1728
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe	565	570	575	
ggc gtg gcc caa aag gag agg atc cgg gag ctc aag gcg gag gtg gac				1776
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp	580	585	590	
acc ctc tac ctc tcc gcc acc ccc atc ccc cgc acc ctc tac tcc gcc				1824
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala	595	600	605	
ctg gtg ggc ctc aaa gac ctt tcc agc atc cag acc ccg ccc ccg ggg				1872
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly	610	615	620	
cgc aag ccc atc aag acc ttc ctc gct ccc ttt gal ccc ctc ttg gtg				1920
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val	625	630	640	
cgg gag gcc atc ctc ttt gag ctg gag cgt ggg ggc aag gtc ttc tac				1968
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr	645	650	655	
gtc cac gac cgg gtg gcc tcc ata gag gcc agg cgg cgc ttt ctg gaa				2016
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu	660	665	670	
aac ctc gtc ccc gag gcc cgc atc ggg gtg gtc cac gcc cag atg ccc				2064
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro	675	680	685	
gaa agc ctc att gag gag acc atg ctc ctc ttc gcc gaa ggg gcg tac				2112
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr	690	695	700	
gac gtc ctc ctc gcc acc acc atc att gag gcg ggc ctg gac gtg ccc				2160
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro	705	710	720	
gag gcg aac acc atc ctc att gag cgg gcg gac cgc ctg ggc ctc gcc				2208
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala	725	730	735	
acc ttg tac cag ctc cgg gcc cgg gtg ggg cgg agg gag gag gag gcc				2256
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala	740	745	750	
tac gcc tac ctc ttc cac ccg cct cgc ctc acc gag gcc gcg gag aag				2304

Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys
755 760 765

cgc ctc gcc gcc atc gcc gac ctc tcc gat ctg gcc tgc gcc cac ctc 2352
Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu
770 775 780

ctg gcc gaa agg gac atg gaa atc cgg gcc gtg ggg aac ctt ttg ggg 2400
Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly
785 790 795 800

cgg gag cag cac ggg cac atc cgg gcg ctt tcc ctc gag gtc tac acc 2448
Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr
805 810 815

gag ctt ctg gaa gag gcc atc cgc aag ctc aag ggg gag gcc aag gag 2496
Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu
820 825 830

gag cgg cgg cac gtg acc ctg gac ctc gcc ctc tcc gcc cgg ctg ccc 2544
Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro
835 840 845

gcg gag tac gtg ggg agc ctc gag gcc agg agc cgc tac tac agc cgt 2592
Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg
850 855 860

ttt gcc gag gcg aaa agc ctc gcc gag ctt tcc cgc ctg gtg cgg gag 2640
Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu
865 870 875 880

ctc aaa gag cgc tac ggg ccc ctt cct gag gag gcg gag aac ttc gtg 2688
Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val
885 890 895

gcc ctc gcc cgg ctc cgc ctg gtg gcg gag agg aag ggg gtg gtg tcc 2736
Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser
900 905 910

atc acg gag ggc ctc acc cac ctg gag gtg gtc ttc ccc cgc tac ccc 2784
Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro
915 920 925

ctg gac tac gac gcc cgc gcc ctc aag ggg ctt ccc tac cgg gtg gag 2832
Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu
930 935 940

ctt acg cag tac cgg ccc ggg ttc cgc ctg gag aag aag gcc ctg agg 2880
Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg
945 950 955 960

ccc cgg gac tac ccc gag gcc ctg atg gag gtg etc tac etc ttc gcc 2928
 Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala
 965 970 975

gac etc 2934
 Asp Leu

· 210 · 8
 · 211 · 978
 · 212 · PRT
 · 213 · Thermus thermophilus

· 400 · 8
 Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro
 1 5 10 15

Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu
 20 25 30

Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala
 35 40 45

Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu
 50 55 60

Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro
 65 70 75 80

Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr
 85 90 95

Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg
 100 105 110

Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val
 115 120 125

Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly
 130 135 140

Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu
 145 150 155 160

Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu
 165 170 175

Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly
 180 185 190

Arg Pro Trp Val Ala Leu Gly Gly Gly Val Glu Leu Pro Pro Leu Glu

195	200	205
Leu Gly Ala Arg Pro Leu	Pro Pro Tyr Arg Gly	Ser Leu Lys Ala Leu
210	215	220
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu		
225	230	235 240
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln		
	245	250 255
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg		
	260	265 270
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu		
	275	280 285
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg		
	290	295 300
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser		
305	310	315 320
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu		
	325	330 335
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val		
	340	345 350
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu		
	355	360 365
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu		
	370	375 380
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg		
385	390	395 400
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys		
	405	410 415
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp		
	420	425 430
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys		
	435	440 445
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met		
450	455	460
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala		

465	470	475	480
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe	485	490	495
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg	500	505	510
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe	515	520	525
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly	530	535	540
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	545	550	555
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe	565	570	575
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp	580	585	590
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala	595	600	605
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly	610	615	620
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val	625	630	635
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr	645	650	655
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu	660	665	670
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro	675	680	685
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr	690	695	700
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro	705	710	715
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala	725	730	735
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala			

740	745	750
Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys		
755	760	765
Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu		
770	775	780
Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly		
785	790	800
Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr		
805	810	815
Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu		
820	825	830
Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro		
835	840	845
Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg		
850	855	860
Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu		
865	870	875
Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val		
885	890	895
Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser		
900	905	910
Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro		
915	920	925
Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu		
930	935	940
Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg		
945	950	955
Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala		
965	970	975
Asp Leu		

· 210 · 9
· 211 · 38
· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 9

atatcatatg gaagcctggc ggaaagccct cctcgctt

38

· 210 · 10

· 211 · 41

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 10

atatagatct ttattatgcg tccgggaggg ggactacgcc c

41

· 210 · 11

· 211 · 31

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 11

atcatatgag agaccgggtc cgctggcggg t

31

· 210 · 12

· 211 · 32

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 12

atagatcttt acaggtccac cgcctggacc tc

32

· 210 · 13

· 211 · 49

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

<223> Description of Artificial Sequence: synthetic DNA

<400> 13

actacttggc acactgacgc gacacgcag gagctcattc cagtgcgca

49

<210> 14

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 14

atatcatatg cgtctctctc tcttcggcga acggaact

38

<210> 15

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 15

atatagatct ttattaggcg ccagggcaca ggaccacccc t

41

<210> 16

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 16

atatcatatg gaaatcgcc tagagaggat ctacggcc

38

<210> 17

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 17

atatagatet ttattagagg teggagaaga ggtagagcac c

41

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100